

POTTER

## MT-36 MAGNETIC TAPE TRANSPORT AND MAGNETIC TAPE SYSTEMS

PRODUCT  
DATA

1-204



### INTRODUCTION

The new Potter MT-36 Magnetic Tape Transport is a low-cost unit designed for applications requiring moderate data transfer rates. It is particularly well-suited for use with small and medium scale computers, in mass storage and sequential access applications for which high-priced, high-performance transports cannot be justified. The MT-36 provides many features normally found only in more expensive transports. New over-and-under vacuum column tape storage is used in combination with Potter's precision tape drive system. Vacuum cleaning and vacuum tape drag before the read-write head assure high operating reliability.

MT-36 tape systems, which consist of an MT-36 tape transport, manual control unit, and suitable read-write electronics, are capable of reading tapes prepared on the IBM 7330. Conversely, tapes written on the MT-36 can be read on a 7330. Packing densities of 200, 556, and 800 bpi can be accommodated. Other conventional tape formats utilizing  $\frac{1}{2}$  or 1 inch tape are also available.

A read-write speed of 36 ips is standard with the MT-36, with fast two and one-half minute rewind. Start-stop profiles are smooth and program restriction free over a command frequency rate up to 200 per second. Other MT-36 design innovations provide simplified tape threading, convenient transport adjustments, and easier maintenance.

### FEATURES

- highest performance and reliability for lowest price
- up to 40 kc data transfer (800 bpi)
- compatible with 7330 and all IBM packing densities
- low inter-channel time displacement
- fast, smooth start-stop performance
- new vacuum cleaning incorporated in trough guides
- new over-and-under vacuum storage system
- vacuum muffled for silent operation
- fast two and one-half minute rewind
- tape loading in 15 seconds
- rapid, consistent tape stops with new vacuum tape drag

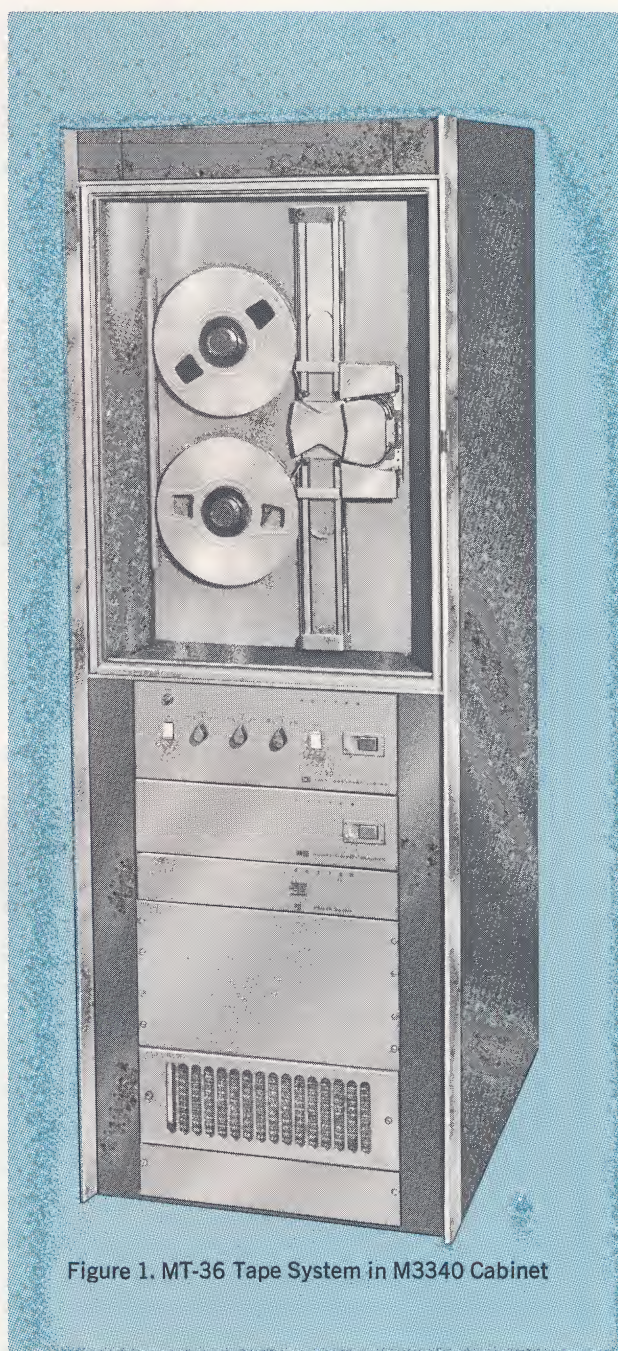


Figure 1. MT-36 Tape System in M3340 Cabinet

EFFECTIVE: APRIL 15, 1964



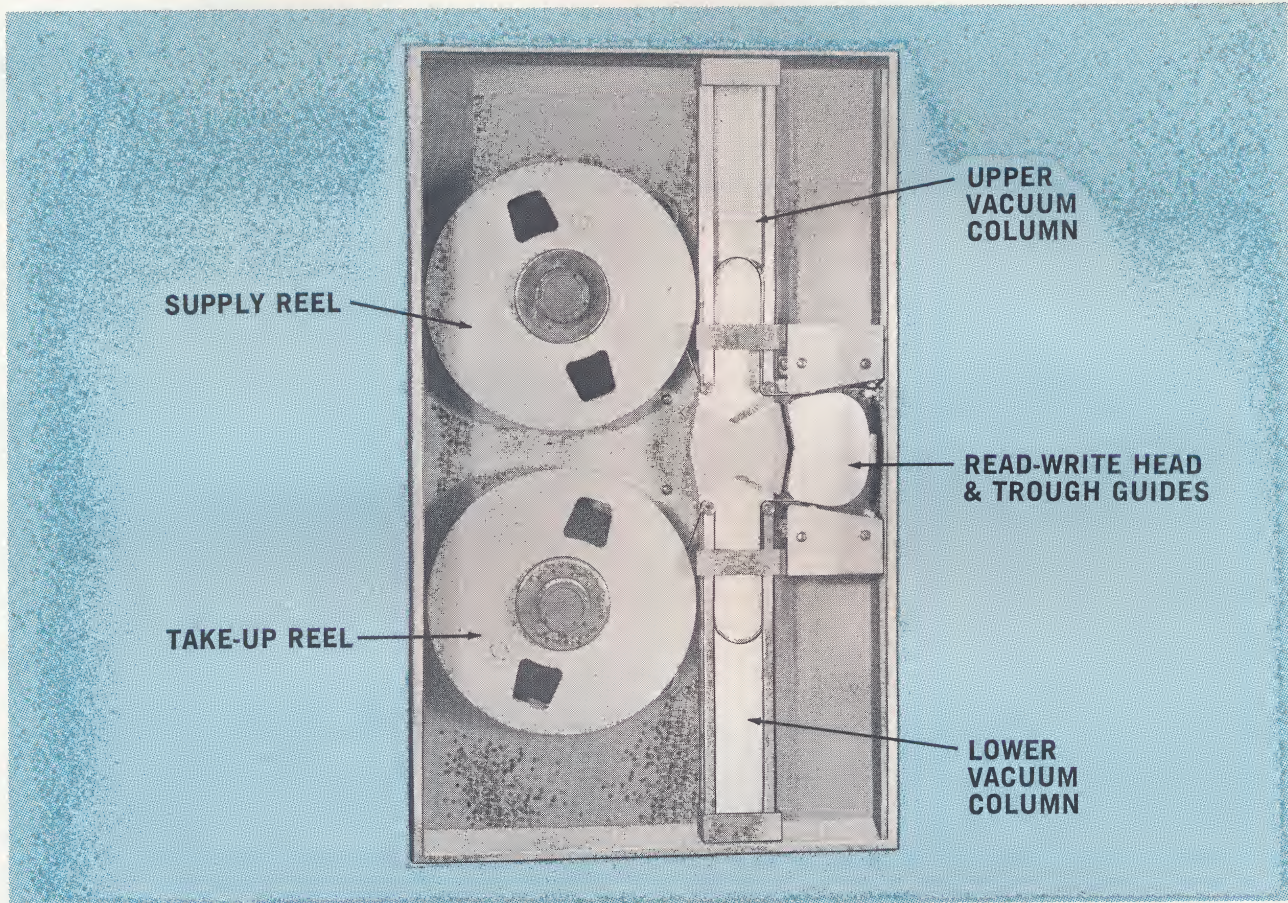


Figure 2. MT-36 Tape Drive

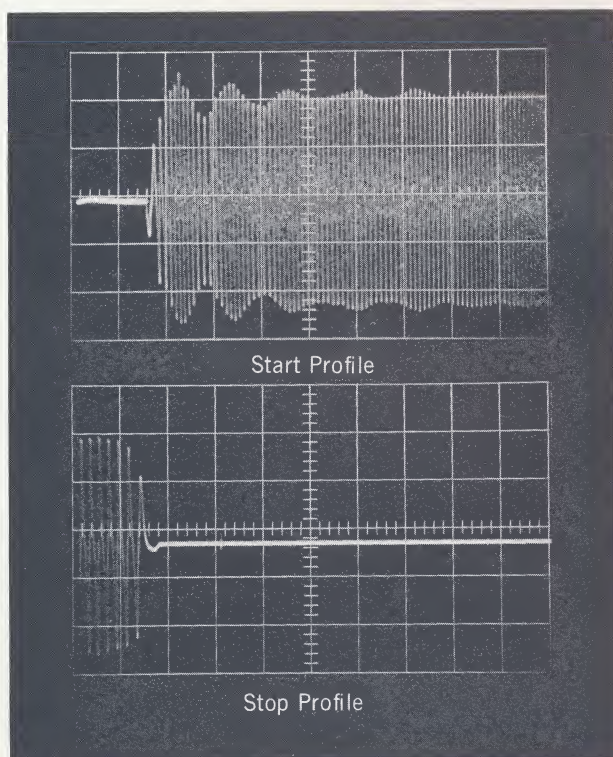


Figure 3. MT-36 Typical Velocity Profiles (1 div. = 1 ms)

### VACUUM COLUMN STORAGE

An extremely simple dual vacuum column tape storage system is incorporated in the MT-36 design—a feature normally associated with the most costly tape transport systems. Ample tape storage in the vacuum reservoirs provides restriction-free reading and writing up to 36 ips. Photoelectric loop sensing reliably controls amount of tape in both vacuum columns. Transparent vacuum column covers are readily detachable for easy access to column area during routine cleaning. The vacuum blower is soundproofed for exceptionally quiet operation.

### TAPE DRIVE SYSTEM

The MT-36 utilizes the Potter fast-response drive system which has become a standard of dependability in the EDP field. Tape motion is controlled by two drive capstans with associated solenoid-actuated drive rollers. New vacuum hold-down of tape in the trough guide area provides improved tape control. The slotted, vacuum trough guides, which are precision-shaped for optimum tape guidance, hold dynamic skew to  $\pm 3$  microseconds maximum at 36 ips. Start time is 5 milliseconds to within  $\pm 10\%$  to rated speed; stop time is less than 1.5 milliseconds, with smooth velocity profiles. (See Figure 3)



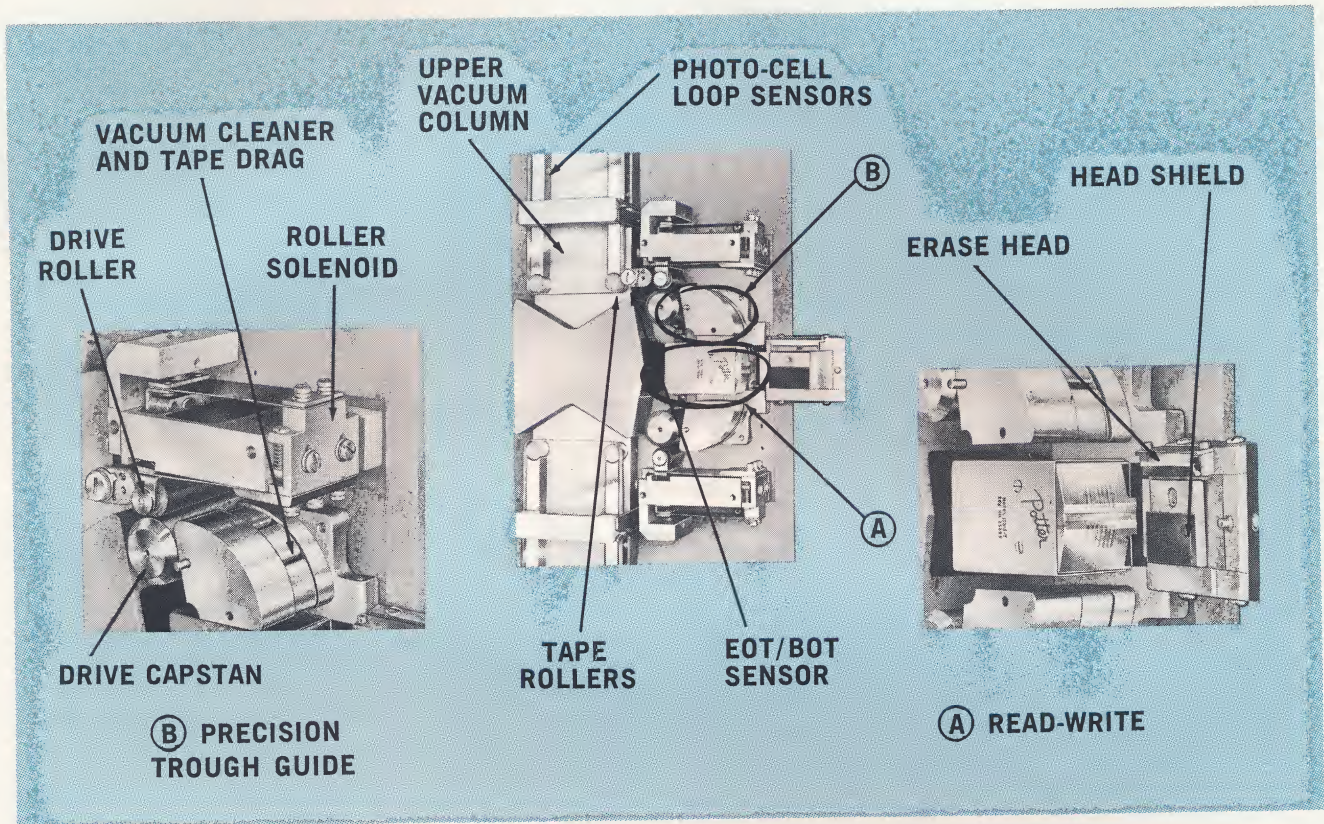


Figure 4. MT-36 Tape Drive System

### DRIVE ELECTRONICS & CONTROL

All MT-36 transport functions are controlled by a combined drive electronics and manual control assembly which is supplied with the transport. This compact package contains all control electronics, together with necessary power supplies for automatic or manual operation and checkout. Electronics are solid state, and feature

printed circuit, plug-in modules. The hinged front door gives immediate access to all components. Controls include a power on-off switch and three operating mode selector switches: "load-manual-automatic", "reverse-stop-forward", and "fast reverse-stop-fast forward."

For remote operation, the LOAD-MANUAL-AUTOMATIC switch is placed in the AUTOMATIC position; other controls in the STOP position.

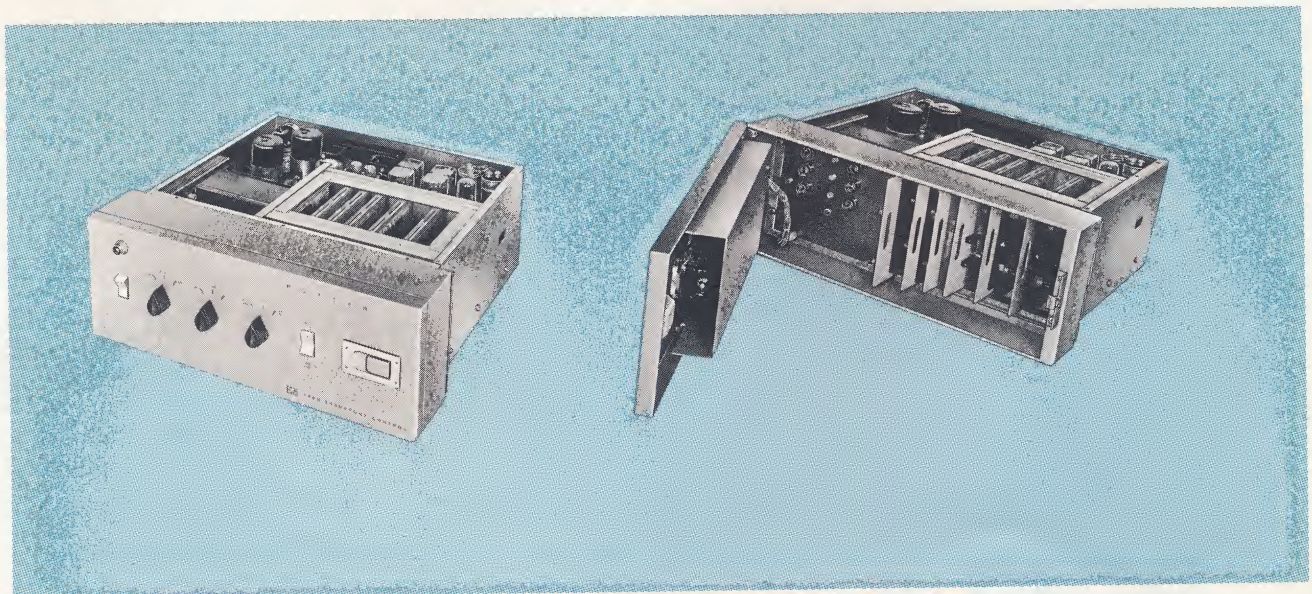


Figure 5. EC-36 Drive Electronics & Control



## ACCESSORIES

### MT-36 TRANSPORT ACCESSORIES

- **READ-WRITE HEADS** — A complete selection of magnetic heads is available including heads for IBM seven channel format. Heads are all-metal, precision fabricated for maximum tape life and minimum interchannel time displacement.
- **REELS & HUBS** — IBM-type reels and hubs are standard equipment on MT-36 transports. Reel/hub combinations of other manufacturers can also be accommodated. Special Potter NAB reels and QUICK-LOCK\* hubs are available for one-inch tapes.
- **EOT/BOT SENSING** — Photoreflexive (IBM-type) end-of-tape and beginning-of-tape sensing is available for reliable MT-36 tape control.
- **WRITE CONTROL** — A Write Lockup (Write Enable) switch is available for use with file protect rings on IBM or NARTB reels.

### MT-36 SYSTEM ACCESSORIES

- **READ-WRITE ELECTRONICS** — Standard amplifiers are available to accommodate packing densities up to 800 bpi and data transfer rates up to 40 kc.

Each read-write electronics assembly contains:

- up to eight read-write amplifier channels
- clock generator
- Write Inhibit electrical switching
- erase head control
- head compensation for read-write (as required)
- power supply

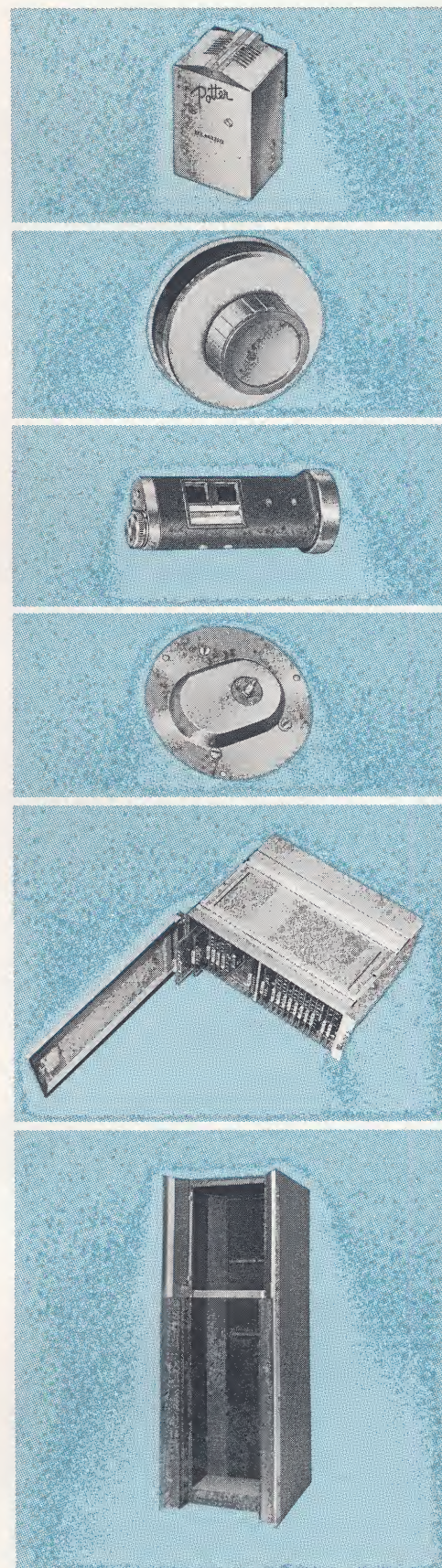
For further information see the following Product Data Sheets:

- No. 1-401 M921A Read/Write Amplifier
- No. 1-402 MA315 Read/Write Amplifier
- No. 1-403 MSA375 Read/Write Switching Amplifier

- **SWITCHING ELECTRONICS** — Switching amplifiers are available which reduce the cost of digital magnetic tape systems by permitting time-sharing of a single Read/Write amplifier package among groups of up to four tape units.

- **CABINET** — A special variation of Potter's standard M3340 rack cabinet accommodates the MT-36 transport and accessories listed above, providing for a complete, self-contained tape system. The sturdy construction of this cabinet permits full swing-out of the MT-36 transport. Standard 19-inch mounting rails provide solid mounting support for drive electronics and read-write amplifier electronics assemblies.

\*Patent applied for. QUICK-LOCK is a trademark of Potter Instrument Company, Inc.





**MT-36 SPECIFICATIONS**

<b>TAPE SPEEDS :</b> Single speed . . . . .	30 & 36 ips standard; other speeds available up to 50 ips
Dual speed . . . . .	combinations in a ratio of 2:1, 3:1, 4:1 and 6:1 available
<b>TAPE SPEED VARIATIONS</b> . . . . .	±2%
<b>TAPE REWIND</b> . . . . .	approximately 2½ minutes for full 2400 foot reel
<b>TYPICAL PERFORMANCE</b> . . . . .	at 36 ips with ½-inch 1.5 mil Mylar tape :
START TIME . . . . .	5 ms from receipt of command to within ±10% of tape speed
START DISTANCE . . . . .	over cycling range of 0-200 commands/second tape travels 0.110" ± .020" 5 ms after receipt of command
STOP TIME . . . . .	less than 1.5 ms
STOP DISTANCE . . . . .	0.036" ± 0.015"
<b>COMMAND REPETITION RATE</b> . . . . .	Start/stop or forward/reverse 0-200 commands per second, 5 milliseconds between commands for performance within specifications.
<b>WOW &amp; FLUTTER</b> . . . . .	less than 2% rms at 36 ips
<b>INTERCHANNEL TIME DISPLACEMENT</b> . . . . .	Static: 8 microseconds maximum
(at 36 ips), any two channels, ½" tape . . . . .	Dynamic: ±3 microseconds
	Total: 11 microseconds, maximum
<b>TAPE WIDTHS</b> . . . . .	½" or 1"
<b>TAPE TYPE</b> . . . . .	1 or 1½ mil Mylar
<b>TAPE REELS</b> . . . . .	IBM type 10½" reels and hubs standard for ½" tapes. Potter NARTB-type reels and special "Quick-lock" hubs standard for 1" tapes; other reel/hub combinations available
<b>TAPE LOADING</b> . . . . .	15 seconds-average tape loading time
<b>REMOTE CONTROL INPUTS</b> . . . . .	Run/Stop; Forward/Reverse; Normal Speed/Rewind Speed; Speed Control High/Low. All 0v/ - 5v @ 6 ma d.c. level
<b>CONDITION INDICATION</b> . . . . .	EOT/BOT Sensing Ready Forward Reply Reverse Reply Automatic-Manual Write Lockout (Type C contact) Power Supply
<b>ELECTRONICS</b> . . . . .	all control circuits completely transistorized; modular plug-in construction used throughout

**PHYSICAL DATA:**

## Dimensions

	High (in.)	Wide (in.)	Deep (in.)	Weight (lbs.)
MT-36 Tape Transport . . . . .	31½	19	11	90
EC-36 Drive Electronics & Control . . . . .	7	19	19	55
M3340 Cabinet . . . . .	76	27	35	415
<b>POWER</b> . . . . .	115 volts ±10%, 60 cycles, 600 watts, 875 watts, peak; 230 volts, 50 cycles, optional			
<b>AMBIENT TEMPERATURE (Operating)</b> . . . . .	32°F to 125°F			



**MT-36 INTERFACE CONNECTIONS**

Letters refer to contact pins, connector J/P-102, EC-36 Drive Electronics Chassis:

- A. -5v run/0v stop, at 5 ma
- B. -5v reverse/0v forward, at 5 ma
- C. Stop at EOT input (place jumper to pin D)
- D. EOT Output: Not on Foil, -15v. Maximum load to ground, 5 ma. On Foil, 0v.
- E. Ready Signal: -10v at 5 ma
- F. 10v nominal servo supply sample at 2 ma
- G. Rewind Command: -5v at 10 ma
- J. Stop at BOT input (place jumper to pin K)
- K. BOT Output: Not on Foil, -15v. Maximum load to ground, 5 ma. On Foil, 0v.
- L. Chassis GND
- M. Circuit GND
- N. Run Reverse Reply: -5v at 1 ma
- P. Run Forward Reply: -5v at 1 ma
- Q. Automatic Mode Reply: -7.5v at 2 ma
- T. Capstan Speed Change Command: -5v at 5 ma
- U. +15v sample (for interrogation only) at 5 ma
- V. -15v sample (for interrogation only) at 5 ma
- W. EOT Lamp Out Signal: Out, 0v, 24 ohms to ground; On, -5v to -10v @ 5 ma
- X. Write Lock-out Switch (normally closed contact)
- Y. Write Lock-out Switch (common contact)
- Z. Write Lock-out Switch (normally open contact)

**MT-24 AND MT-75 TAPE TRANSPORTS AND TAPE SYSTEMS**

The MT-36 is one member of a family of vacuum-buffered tape transports providing a range of speed capabilities as follows:

MT-24 Tape Transport . . . .	1 to 36 ips
MT-36 Tape Transport . . . .	1 to 50 ips
MT-75 Tape Transport . . . .	1 to 75 ips

All these units employ the same basic design configuration, and most parts are interchangeable between models.

**POTTER WORLDWIDE FIELD SERVICE AND LOGISTICS PROGRAMS**

Repair centers in strategic locations within the continental United States and abroad have been established to support the entire Potter product line.

Staffed by highly-trained field representatives, these repair centers are equipped to effect on-site installation of equipments and to perform quality repair, maintenance and overhaul.

Supplementing this capability, if a customer prefers to provide his own equipment support, Potter has established standard instruction courses to train customer personnel, either at Potter or in the field.

A Spare Parts Department, backed up by an extremely large inventory, and streamlined order processing, is available for customer convenience and economy. This inventory permits the customer to realize virtual elimination of downtime as well as savings on spare parts dollars by offering expeditious delivery for replaceable parts. Delivery is available in 24 hours to meet customer emergency requirements — within 72 hours for standard parts under normal conditions. Potter also offers provisioning and logistics capabilities to meet all existing military specifications.

The Potter field service and logistics program is one of the finest in the EDP equipment industry. With reliable, quality-engineered equipment, supported by comprehensive field service, Potter guarantees satisfaction.

Information subject to change without notice.



**POTTER INSTRUMENT COMPANY, INC.**

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